Al Ma'ali Science Department Grade 6 2023-2024

EOT Term 3: Paper Part Practice Questions

Compiled by: Ms Taybah Jaffar

Question 1: Calculate the relationship (ratio) for two traits in plants and animals. Differentiate between dominant and recessive traits and apply it on examples.

(Page 13, 14,15,18,20)

a) Complete the table below.

Results of Hybrid Crosses			
Characteristic of Hybrid Parent	Trait and Number of Offspring	Trait and Number of Offspring	Trait Comparison
Flower Color (purple x purple)	Purple 705	White 224	$\frac{705}{224} = \frac{3.15}{1}$
Seed Color (yellow x yellow)	Yellow 6,022	Green 2,001	$\frac{6,022}{2,001} = \frac{3.01}{1}$
Seed Shape (round x round)	Round 5474	Wrinkled 1,850	$\frac{5474}{1,850} = \frac{2.96}{1}$
Pod Shape (smooth x smooth)	Smooth 882	Bumpy 299	$\frac{882}{299} = \frac{2.95}{1}$

b) Compare a dominant and recessive trait.

Dominant trait: a genetic factor that blocks another genetic factor. (The stronger one)

Recessive trait: A genetic factor that is blocked by the genetic factor. (The weaker one)

Phenotype and Genotype		
Phenotypes (observed traits)	Round	Wrinkled
Genotypes (alleles of a gene)	RR	Rr	rr

1. Which genotype is homozygous dominant? RR
2. What do the letter Rr represent? Heterozygous
3. What is the genotype for wrinkled phenotype? rr-homozygous recessive

d) A cross between two heterozygous pea plants with yellow seeds produced 1719 yellow seeds and 573 green seeds, What is the ratio of yellow seeds to green seeds? What does this show about the inheritance?

1719 divided by 573 = 3

Ratio: Yellow seeds : Green seeds
                        3 : 1

This shows that the yellow seed trait is the dominant trait and more of the offspring will be this color.

e) Use the Punnet square to complete the cross between a female fruit fly with straight wings (cc) and a male fruit fly with Curly wings (CC).

	C	C
c	Cc	Cc
c	Cc	Cc
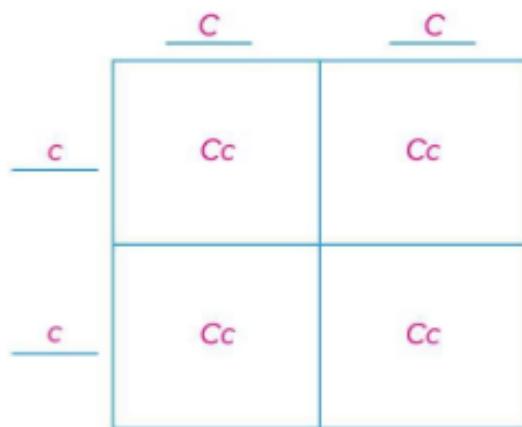
Which genotypes are possible for the offspring? Cc- 100% heterozygous offspring

What name is given to this type of offspring? Hybrid

f) Complete the table below.

Results of Hybrid Crosses			
Characteristic of Hybrid Parent	Trait and Number of Offspring	Trait and Number of Offspring	Trait Comparison
Flower Color (purple x purple)	Purple 90	White 30	$\frac{90}{30} = \frac{3}{1}$
Seed Color (yellow x yellow)	Yellow 300	Green 100	$\frac{300}{100} = \frac{3}{1}$

Question 2: Compare between types of reproduction (sexual and asexual) in hydra and plants. (Page 32,33,35,36)

a) Define Asexual and Sexual reproduction in the table below.

Asexual Reproduction	Sexual Reproduction
Asexual reproduction needs only one parent organism, offspring is genetically identical to parent.	Sexual reproduction needs two parent organism, offspring is genetically diverse.

b) Name three types of asexual reproduction and give an example of each.

Type of Asexual Reproduction	Example
1. Regeneration	Starfish
2. vegetative reproduction	Potato
3.Budding	Hydra

c) Hydras can reproduce asexually and sexually. Looking at the picture, explain the type of reproduction shown, what are some advantages and disadvantages of this type of reproduction?
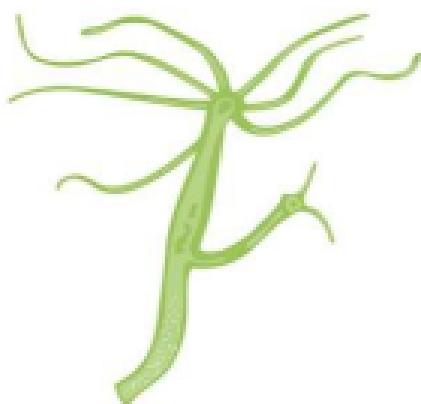
This hydra is reproducing asexually.

The new organism is growing on the parent organism.

Advantage: happens quickly

Disadvantage: no genetic diversity, they will all be the same.

d) A fatal disease is spreading through an aquarium containing both fish, which reproduce sexually and sponges, which reproduce asexually. The disease has been identified in both species. Which species would be most likely to survive?

The fish would be most likely to survive as it goes through sexual reproduction. The new fish will be genetically diverse, meaning they would be stronger to fight the disease.

The sponges would be weaker as they reproduce asexually, leaving little genetic variation. The parent would carry the gene for the disease and pass it to the next generation.

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e) Complete the venn diagram comparing sexual and asexual reproduction.

Sexual Reproduction	Both	Asexual Reproduction
-requires more than one organism -offspring are genetically unique	-both create a new organism	-requires one organism -genetically identical offspring
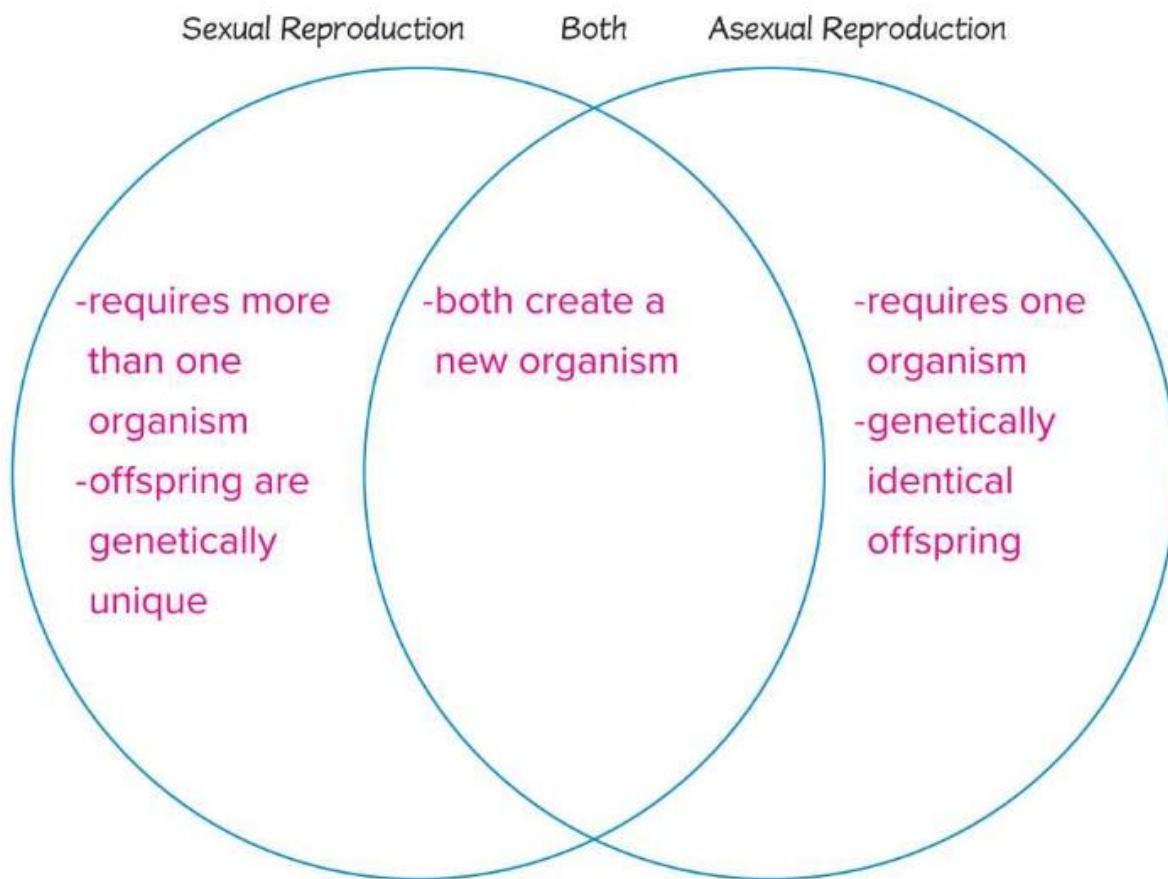
Question 3: Compare animal behaviors (courtship and protecting young) by giving examples and between factors that affect the growth of young animals. Assign the factors (wind, water, animals) for seed spreading.
(Page 47,51,52,58,60,62,75)

a) What is a behavior? The way an organism reacts to other organsims.
b) Name 5 ways animals attract mates through communication. Sound, light, chemicals, body language, competition.
c) Look at the pictures and describe how each animal is displaying courtship behaviors.

Courtship behavior: competition

The male mule deer is physically displaying his aggression with another male.

Courtship behavior: Pheromones

White female gypsy moths release chemical substances to attract males.

Courtship behavior: mating sounds

Some frogs and bords use mating songs to gain the attention of the females.

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d) Answer the following questions:

INVESTIGATION

Staying Safe

When goslings, or baby geese, see a bird in the air that has a different wingspan or shape than the parent goose, they duck down.

1. Look at the images of the three birds in flight. Describe the differences between each silhouette.

   Answers may vary. Sample answer: The wingspans are different shapes and lengths. The necks and the beaks are also different.
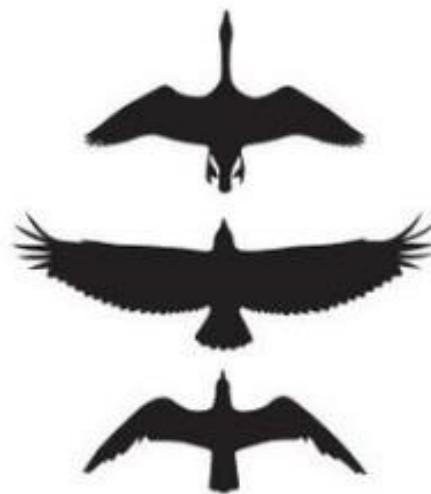
2. Choose at least two characteristics that are different for each bird.

   Anwers may vary. Sample answer: The lengths of the necks and the wingspans are different for each bird.

3. How could recognizing differences help a gosling survive?

   Answers may vary. Sample answer: The gosling would duck upon seeing a predatory bird, thus becoming less visible to the predator.

e) Give examples of nurturing behaviors that animals show towards their young.
  - Building nests or dens
  - Herding
  - Circling

f) What factors will determine how a animals will grow and develop? Use the

Environmental Causes
Answers may vary. Sample answer: food availability, exercise, and diet

Genetic Causes
Answers may vary. Sample answer: traits of parents such as fur color

Mechanisms
(What processes lead to the effects?)
Answers may vary. Sample answer: interactions with others, routine, training

Mechanisms
(What processes lead to the effects?)
Answers may vary. Sample answer: genes are transferred from parents to offspring

Effects
Answers may vary. Sample answer: personality, ability to do tricks, muscle tone, weight

Effects
Answers may vary. Sample answer: color of fur and eyes, length of hair

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g) Complete the graphic organizer.

Behaviors That Increase the Probability of Successful Reproduction

Courtship
Answers may vary. Sample answer: Animals engage in certain courtship behaviors, such as dancing, competing with others, and bringing gifts in order to attract a mate.

Protecting Young
Answers may vary. Sample answer: Animals engage in certain behaviors in order to protect their eggs and their young. Some animals build nests and herd young in order to protect them.

Factors That Affect the Growth of Young Animals

Environmental Factors
Answers may vary. Sample answer: Environmental factors such as diet, exercise, availability of water and space, and interactions with other organisms determine how an animal will grow.

Genetic Factors
Answers may vary. Sample answer: Genetic factors such as hair color and eye color are passed down through the genes of the parents.

h) Write down how each seed travels from place to place using wind, water or animals.

Seed	Dispersal method
Dandelion	Wind
Coconut	Water
Begger-ticks	Animals
Milkweed	Wind
Water Lilly	Water
Blackberry	Animals
Maple	Wind
Mangrove	Water
Acorn	animals

Question 4: list the cause-and-effect relationships between human activities and the environmental impacts on land (page 22)

THREE-DIMENSIONAL THINKING

Summarize your understanding of the cause-and-effect relationships between human activities and the environmental impacts on land in the table below.

Type	Causes	Effects
Deforestation	needing land for living space, urban development, agriculture, and resources from trees	loss of biodiversity; decrease in soil quality; increase in carbon dioxide levels
Agriculture	As human populations grow, so does our need for food.	groundwater contamination from fertilizers; desertification; takes up space
Urbanization	Increase in population leads to the development of land for houses and other buildings.	increased flooding; habitat disruption; disappearance of wetlands
Waste Disposal	Increase in population means more waste produced.	landfills take up space; hazardous substances can leak into groundwater; increased pollution

Question 5: Describe how humans pollute Earth's water, and ocean pollution sources, and how to minimize this impact (Page 49, 51, 55)
Explain what is air pollution, and how it affects our atmosphere and ozone (page 64, 65, 66)

a) Look at the pie chart and answer the questions that follow:

Ocean Pollution Sources

Runoff from land 44%

Airborne pollutants that originate on land 33%

Spills from shipping 12%

Dumping trash directly into the ocean 10%

Offshore mining and drilling for resources 1%
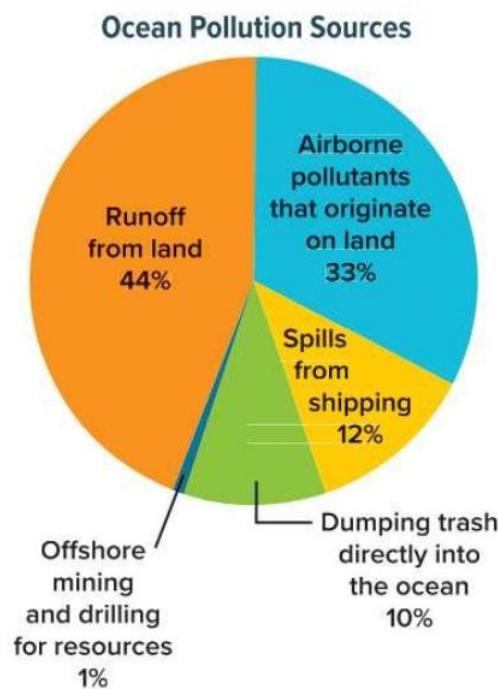
1. Complete the sentence: Any harm to the physical, chemical, or biological health of the ocean ecosystem is called ocean pollution.
2. What natural source can cause ocean pollution? Volcanic eruption
3. Which sector was the highest source for ocean pollution? Runoff from land
4. What sector amounts to 10% of ocean pollution? Offshore mining and drilling for resources.

b) Look at the pictures and describe how each pollutes the Earths water and oceans.

Solid waste from plastic bottles, bags, glass and foam containers.

Most of these items do not decompose and break up easily.

Lots of this trash can be collected in the North Pacific Gyre and is called the "The great pacific garbage patch".
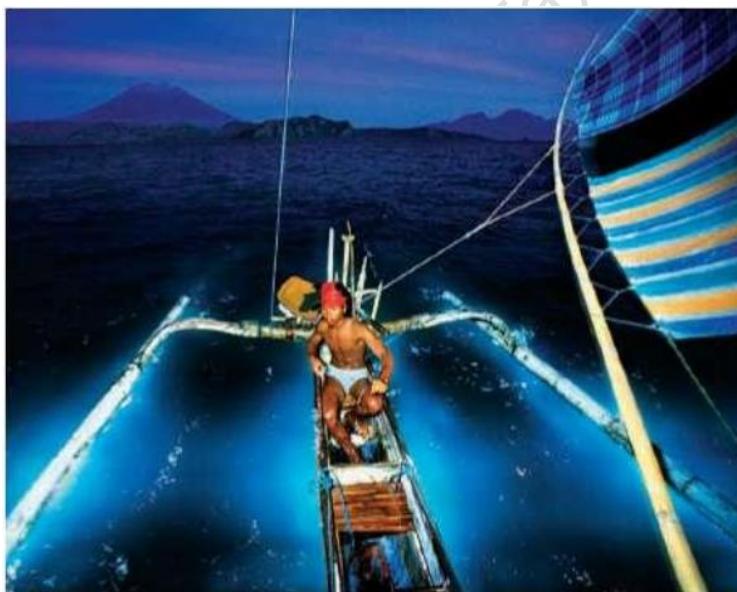
Excess nutrients like nitrogen and phosphorus help algae to grow. Too many of these nutrients can cause an algal explosion-too many in the water.

This cause water to look red, green, brown and may even glow at night

Excess sediment such as sand and rock can enter water due to erosion along the riverbanks.

It can also occur because of cutting down trees, the soil becomes weaker as the roots cannot hold it.

Excess sediment can clog the filtering feeders and block sunlight.

c) In what ways can we prevent pollution in the water and ocean?

- Recycle
- Dispose of chemicals in the correct way, not in the rivers and oceans.
- Use less water, take shorter showers
- Each country has laws to help conserve water

d) What is air pollution?

The contamination of air by harmful substance including gases and smoke.

e) Look at the two pictures and answer the questions that follow?

1. How would you describe the change in the two pictures?

Air appear hazy and brown in the picture on the right, picture on the left air is clear.

2. What do we call this type of air pollution? Photochemical smog
3. What two chemical compounds react with sunlight to form this type of air pollution. nitrogen and carbon
4. How does this affect the atmosphere?

Nitrogen and carbon react with the sunlight and form ozone. Ozone close to the surface makes it difficult to breathe, can damage plants and animals.

f) Use the picture to describe what has happened to the ozone layer from 1979 to 2016.
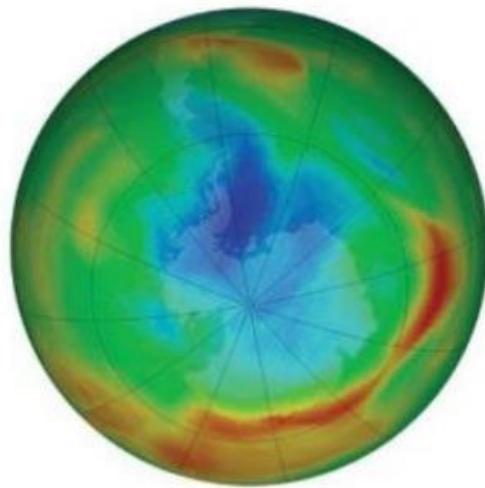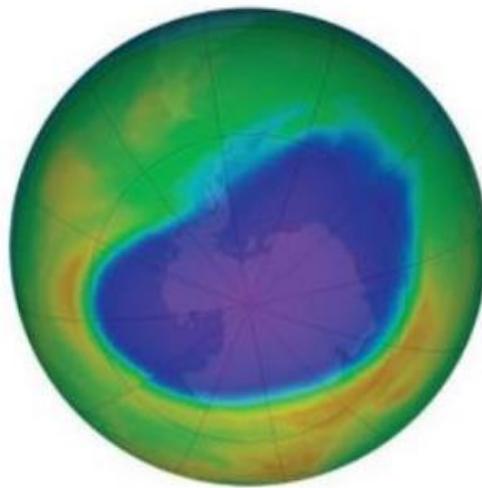
The image from 2016 shows a decrease in ozone. Allow students to speculate. Some students might be aware that chlorofluorocarbons (CFCs) are strongly implicated in the ozone reduction in the upper atmosphere. Others may simply suggest air pollution.

g) Describe the change you see in these two pictures? How is the atmosphere affected?

Air on the right appears dense, filled with particles.

This is an example of particulate matter, a mix of sold and liquid particles in the atmosphere.

Occurs due to burning of fossil fuels as well as natural disasters such as volcano eruptions and forest fires.

Can cause asthma, heart attacks.

Prevents sunlight entering so photosynthesis decreases.